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# THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXV December 1, 1941 Number 22

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Leaf rust infection, especially on volunteer or early-sown oats and wheat, has been general in the southern Plains region, page 554.

G. W. Carver reports Cercospora leaf spot of Chrysanthemum in Alabama, page 555.

## CHECK LIST REVISION

Freeman Weiss

### PIPER (PIPERACEAE)

PIPER spp., PEPPER. Shrubs, climbers and herbs of tropical regions, some of which are cult. for ornament in the American tropics but hardly including the Piper spp. of commerce as black pepper and cubeb.

Cephaleuros virescens Kze., green scurf. P.R.
Cercoseptoria piperis (Stevens & Dalbey) Petr., leaf spot. P.R.
Cercospora piperis Pat., leaf spot, P.R. and C. portoricensis Earle, Canal Zone & P.R.
Cyclodothis pulchella Syd., black leaf spot. P.R.
Glomerella cingulata (Ston.) Spauld. & Schrenk.
Guignardia pipericola F. L. Stevens, leaf spot. P.R., Virgin Is.
Irenina glabra (Berk. & Curt.) F. L. Stevens and I. glabroides F.L. Stevens, black mildew. Canal Zone, P.R.
Irenopsis piperis (Earle) F.L.Stevens and I. tortuosa (Wint.) F.L.Stevens, black mildew. Canal Zone, P.R.
Meliola contorta F.L.Stevens and M. paucipes F.L.Stevens, black mildew. P.R.
Omphalia flavida (Cke.) Maubl. & Rang., leaf spot. P.R.
Podosporium effusum Pat., on leaves. P.R.
Rosellinia bunodes Berk. & Br., root rot. P.R.
Sclerotium rolfsii Sacc., Southern wilt. Fla.
Stigmatea piperis Rehm, on leaves. Virgin Is.

### PIPTADENIA (LEGUMINOSAE)

PIPTADENIA spp. Tropical shrubs or trees grown for gum or ornament.

Ravenelia cebil Speg., rust (II,III). P.R.

### PIPTURUS

PIPTURUS ALBIDUS

Botryosphaeria ribis var. chromogena Shear et al., on branches. T.H.
Irenina triloba (Wint.) F.L.Stevens, black mildew. T.H.
Cercospora pipturi Stevens & Glick, leaf spot. T.H.

### PISCIDIA (LEGUMINOSAE)

PISCIDIA ERYTHRINA L.

Ravenelia piscidiae Long, rust (II,III). Fla.

PISTACIA (ANACARDIACEAE)

PISTACIA spp., PISTACHE. Trees or shrubs of tropical regions grown for edible seeds, gums and oil, especially P. VERA L. of the Mediterranean region and Orient, cult. in S. Calif. and Texas; and P. chinensis Bunge, of China, cult. for ornament in the South and as stock for P. vera. P. TEXANA Swingle is endemic in Growth Regions 11 & 17.

Cercospora sp., leaf spot. Md.
Corticium stevensii (Noack) Burt, thread blight. Fla., Texas.
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Phyllosticta lentisci (Pass.) Allesch., leaf spot. Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Calif., Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ga.
Pleurotus ostreatus Fr., sapwood rot. Calif.
Schizophyllum commune Fr., sapwood rot. Calif.
Tryblidiella fusca (Ell. & Ev.) Rehm and T. rufula (Spreng.) Sacc. on branches. Fla.

PITHECELLOBIUM (LEGUMINOSAE)

PITHECELLOBIUM BREVIFOLIUM Benth., HUAJILLO, and P. FLEXICAULE (Benth.) Coult., EBONY BLACKBEAD. Evergreen shrubs or small trees of Growth Region 17, the latter grown for wood and for ornament.

Ravenelia gracilis Arth., rust (O,I,II,III). Texas
R. siderocarpi Long, rust (II,III). Texas.

PITHECELLOBIUM UNGUIS-CATI (L.) Benth., catsclaw blackbead. Small tree of S. Fla. and West Indies; also P. DULCE Benth., GUAMACHIL, of tropical America and Pacific Islands, grown for ornament in S. Fla. and southward.

Colletotrichum erythrinae Ell. & Ev., leaf spot. P.R.
Heterodera marioni (Cornu) Goodey, root knot.
Hysterographium pithecellobii Seaver, on twigs. P.R.
Phomopsis sp., twig blight. Fla.
Phyllosticta pithecolobii E. Young, leaf spot. P.R.
Physalospora fusca N.E.Stevens and P. rhodina (Berk. & Curt.) Cke., on branches. Fla.
Polyporus gilvus Schw., wood rot. T.H.
Ravenelia pithecolobii Arth., rust (II, III). Fla., P.R.

PITTOSPORUM (PITTOSPORACEAE)

PITTOSPORUM spp. Evergreen shrubs or trees of E. Asia to Australia and Pacific Islands. In the U.S. P. TOBIRA Ait. is commonly grown in the far South for hedges, and several Australian spp. of tree form are cult. in Calif.

PITTOSPORUM -- Continued.

Cercospora pittospori Plakidas, angular leaf spot. S.Car. to Texas.
Corticium stevensii (Noack) Burt, thread blight. La.
Diplodia sp., foot rot. Fla.
D. pittospori Cke. & Harkn., on twigs. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Mycosphaerella pittospori Cke., on leaves. S.Car.
Phomopsis pittospori (Cke. & Harkn.) Grove, on twigs. Calif.
Phyllosticta sp., leaf spot. Ala.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Sclerotium rolfsii Sacc., southern wilt. Fla., Texas.
Verticillium albo-atrum Reinke & Berth., wilt. Calif.
Mosaic, undet. virus. Calif.
Variegation, ? virus. Variegated forms of P. tobira are in cult.; transmission of the anomaly by grafting has been reported in France but not demonstrated in the U.S.

PLANERA (ULMACEAE)

PLANERA AQUATICA (Walt.) Gmel., PLANERTREE, WATER-ELM. Deciduous tree of Growth Regions 20, 25, 29, 30.

Daedalea ambigua Berk., wood rot. S.Car.
Ganoderma lucidum (Leyss. ex Fr.) Karst., wood rot.

PLATANUS (PLATANACEAE)

PLATANUS ACERIFOLIA (Ait.) Willd., LONDON PLANE-TREE. Large deciduous tree of hybrid origin (P. occidentalis x P. orientalis), used extensively in street plantings for shade, Zone V; several hort. vars., some variegated.

Ceratostomella sp. (strain of C. fimbriata (Ell. & Hals.) Elliott= Endoconidiophora fimbriata (Ell. & Hals.) Davidson), London plane blight. Del., Md., N.J., Pa.; also Ky., N.Car., Tenn., Va., W.Va.
Gnomonia veneta (Sacc. & Speg.) Kleb. (Gloeosporium nervisequum (Fckl.) Sacc.), anthracnose, canker. N.J., N.Y., Calif. (Somewhat resistant).
Massaria platani Ces., on branches, ? canker. N.J.
Microsphaera alni D C. ex Wint., powdery mildew. N.J., N.Y.
Rosy canker, -- illuminating gas in soil. N.J., N.Y.

PLATANUS OCCIDENTALIS L., AMERICAN SYCAMORE, AMERICAN PLANE (or PLANETREE). Large tree of Growth Regions 16, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30; also cult. as street tree, Zone IV. Several geographic vars. have distinctive names but are all included here.

Armillaria mellea Vahl ex Fr., root rot. Md., W.Va., Texas.

PLATANUS -- Continued.

Botryosphaeria ribis var. chromogena Shear et al., on branches. Fla., Pa.
Ceratostomella sp. (? C. fimbriata (Ell. & Hals.) Elliott), blight, canker, tracheomycosis. Miss., Pa., Va., W.Va.
Cercospora platanicola Ell. & Ev., leaf spot. Conidial stage of Mycosphaerella platanifolia.
Cytospora platani Fckl., on twigs. New England to Va., Texas.
Daedalea ambigua Berk. and D. confragosa Bolt. ex Fr., wood rot. Widespread.
Exosporium platanorum Tharp, on leaves. Texas.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled heart rot. Conn.
F. pinicola (Sw. ex Fr.) Cke. and F. scutellatus (Schw.) Cke.
Gloeodes pomigena (Schw.) Colby, on branches. Ind.
Gnomonia veneta (Sacc. & Speg.) Kleb. (Gloeosporium nervisequum (Fckl.) Sacc., anthracnose, twig blight, canker. General.
(Hendersonia desmazieri Mont. and H. platani Pk.): Massaria platani.
Hydnum erinaceus Bull. ex Fr., trunk rot sometimes on living trees. N.Car.
Libertella sp., on branches. La.
Massaria platani Ces., twig blight, canker. Widespread.
Microsphaera alni D C. ex Wint., powdery mildew. Widespread. The var. extensa (Cke. & Pk.) Salm. is reported in N.Car.
Mycosphaerella platanifolia (Cke.) Wolf (Cercospora platanicola Ell. & Ev.), leaf spot. N.Car. to Ga. and La., Iowa.
M. stigmina-platani Wolf (Stigmina platani (Fckl.) Sacc.), leaf spot. N.Car. (Sphaerella platani Ell. & Mart., differing from this and the preceding, reported on living leaves in Kans.).
Myxosporium platanicolum Ell. & Ev., on branches. W.Va.
Ophiodothella leucospila (Berk. & Curt.) Miller & Thompson, on fallen leaves. Ga.
Phleospora multimaculans Heald & Wolf, leaf blight. Texas.
Phomopsis scabra (Sacc.) Trav., on twigs. Ohio, W.Va. Conidial stage of Diaporthe eres Nit.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Tenn., Texas.
Phyllactinia corylea (Pers. ex Karst.), powdery mildew. Ind.
Phyllosticta platani Sacc. & Speg., leaf spot. Md., Mass., Va., Ala., Kans. (? Spermatial stage of Mycosphaerella platanifolia.)
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora spp., on branches. P. fusca N.E.Stevens and P. rhodina (Berk. & Curt.) Cke., N.Car.; P. obtusa (Schw.) Cke., Va. to La.
Polyporus spp., wood rot. P. adustus Willd. ex Fr., P. galactinus Berk., P. gilvus Schw., P. hirsutus Wulf. ex Fr., P. lacteus Fr., P. rigidus Mont., P. sanguineus Fr., P. versicolor L. ex Fr.
Pseudovalsa bicornis (Cke.) Sacc., on bark. N.Y.
Septoria platanifolia Cke., leaf spot. Ga., Md., S.Car., W.Va.
Stereum bicolor Pers. ex Fr. and S. purpureum Pers. ex Fr., wood rot. Widespread.
Stigmina platani (Fckl.) Sacc., leaf spot. (Conidial stage of Mycosphaerella stigmina-platani.)

PLATANUS -- Continued.

PLATANUS ORIENTALIS L., ORIENTAL PLANE. Large tree of S.E.Europe and W. Asia; widely grown for shade but not commonly used in street plantings, Zone VI.

Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose. General.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
Oidium obductum Ell. & Langl., powdery mildew. Pa., Va., W.Va.
Phytophthora cambivora Rands, seedling root rot. Md.
Stigmina platani (Fckl.) Sacc., leaf spot. Calif.

PLATANUS RACEMOSA Nutt., CALIFORNIA SYCAMORE or PLANE. Large tree of Growth Regions 3, 4, 5. A few records on P. WRIGHTII Wats., ARIZONA SYCAMORE, In G.R. 10 & 11 are included.

Armillaria mellea Vahl ex Fr., root rot. Ariz., Calif.
Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose. Calif.
Massaria platani Ces., canker. Calif.
Microsphaera alni DC. ex Wint., powdery mildew. Calif.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ariz., Calif.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz.
Stigmella platani-racemosae Dearn. & Barth., leaf spot. Calif.

PLUMERIA (APOCYNACEAE)

PLUMERIA spp., FRANGIPANI. Deciduous shrubs or small trees of West Indies, sometimes planted for ornament.

Coleosporium domingense (Berk.) Arth., rust (II,III). Fla., Canal Zone, P.R.
Meliola tabernaemontanae Speg., black mildew. P.R.

PODOCARPUS (TAXACEAE)

PODOCARPUS spp., especially P. ELONGATA L'Her., P. MACROPHYLLA (Thunb.) G.Don and P. NAGI (Thunb.) Hilger. Coniferous evergreen trees or shrubs of S.Africa, Australasia and Japan, cult. for ornament and as hedgeplants in the far South and Calif.

Corynelia portoricensis (F.L.Stevens) Fitz., on living leaves (of P. coriacea). P.R.

POINCIANA (LEGUMINOSAE)

POINCIANA spp., especially P. PULCHERRIMA, DWARF POINCIANA. Tropical shrubs or small trees, grown for ornament in the far South and West Indies. (Royal poinciana or flamboyant, formerly P. regia Bojer, = Delonix regia Raf.)

POINCIANA -- Continued.

Botryosphaeria ribis var. chromogena Shear et al., on branches. Fla.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Gloeosporium sp., anthracnose. Fla.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Fla.
Ravenelia humphreyana P. Henn., rust (II,III). Fla., P.R.

POPULUS (SALICACEAE)

POPULUS spp., ASPEN, COTTONWOOD, POPLAR.* Occurring on various or undetermined spp.

Armillaria mellea Vahl ex Fr., root rot. Occasional, noted especially in the West.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., and var. chromogena Shear et al., on branches, sometimes causing cankers. Widespread but noted especially in the South.
Cenangium populneum Pers. ex Rehm, on dead branches. Widespread. (Appears not to be related to Dothichiza populea as sometimes suggested).
Collybia velutipes Fr., wood rot usually of logs & stumps, sometimes on living trees. N. Rocky Mt. States.
Cryptodiaporthe salicina (Curr.) Weh., on branches. Mich., N.Y.
Cryptosphaeria populina (Pers. ex Fr.) Sacc., on dead branches. Widespread.
(Cylindrosporium oculatum Ell. & Ev.): Septoria musiva.
Cytospora chrysosperma Pers. ex Fr., on twigs & branches, causes canker & dieback in some spp. especially in the West. Conidial stage of Valsa sordida.
C. nivea (Hoffm. ex Fr.) Sacc. Conidial stage of Valsa nivea.
Daedalea confragosa Bolt. ex Fr. and D. unicolor Bull. ex Fr., white mottled heart rot, sometimes on living trees. Occasional.
Didymosphaeria populina Vuill. (Venturia tremulae Aderh.), shoot blight. N.E. States to Wis.
Dothichiza populea Sacc. & Briard, branch & trunk canker. Widespread.
Favolus alveolaris DC. ex Quel., wound rot, white heart rot. Occasional.
Fomes spp., wood rot, chiefly of trunks & logs. Spp. reported include F. connatus (Weinm. ex Fr.) Gill. in the N.E. States, and F. annosus (Fr.) Cke., F. fomentarius (L. ex Fr.) Kickx, F. pinicola (Sw. ex Fr.) Cke. in the N. Central and Western States.
F. applanatus (Pers. ex Fr.) Gill., butt rot, white mottled heart rot. Widespread, especially in the West.
F. igniarius (L. ex Fr.) Kickx, white spongy heart rot. Widespread.
(Fusicladium radiosum (Lib.) Lind): Napicladium tremulae.

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* Because of the numerous species and varieties, together with natural interspecific hybrids comprised within the genus Populus, they are arranged here in groups composed of botanically and geographically related forms.

POPULUS -- Continued.

(Gloeosporium populi (Lib.) Mont. & Desm.): Marssonina populi.
(G. stenosporum Ell. & Kell.): Marssonina stenospora (Ell. & Kell.) Magn., ? Septoria populi.

Hydnum coralloides Scop. ex Fr., wood rot chiefly of logs. N.W.States.

Hypoxylon pruinatum (Klotzsch) Cke., trunk canker. N.E. and Great Lakes States.

Lenzites sepiaria Wulf. ex Fr. and occasionally L. betulina L. ex Fr., L. trabea Pers. ex Fr., and L. vialis Pk., sapwood rot, sometimes brown heart rot of living trees. Widespread.

Marssonina spp., leaf spot. Widespread. Reported under several imperfectly distinguished specific names, by some regarded as all synonyms of M. populi (Lib.) Magn. but by others segregated into at least 2 spp. distinguished in their perfect stages, and others in which this stage is unknown: M. castagnei (Desm. & Mont.) Magn., conidial stage of Drepanopeziza (Pseudopeziza) populi-albae (Kleb.) Nannf. and M. populi-nigrae Kleb., conidial stage of D. populorum (Desm.) Höhn. The former has been collected in the U.S., the latter not certainly. M. populi antedates M. castagnei. Others collected here are reported as M. brunnea (Ell. & Ev.) Magn., M. pyriformis (Riess.) Magn., M. rhabdospora (Ell. & Ev.) Magn. and M. stenospora (Ell. & Kell.) Magn.; the latter 2 doubtfully of this genus. In this list all are reported as Marssonina spp.

Melampsora abietis-canadensis (Farl.) Ludwig, leaf rust (II,III). On native and introduced poplars, N.E. States to Great Plains. O and I on Tsuga canadensis.

M. albertensis Arth., leaf rust (II,III). On native poplars Mont. to N. Mex., Calif. & Alaska. O and I on Pseudotsuga taxifolia.

M. medusae Thüm., leaf rust (II,III). On native and introduced poplars throughout the U.S. except the far South. O and I on Larix laricina.

M. occidentalis Jacks., leaf rust (II,III). On native poplars Mont. to Calif. & Wash. O and I unknown, on Larix?

Mycosphaerella spp., parasitic or occurring on fallen leaves.

M. macularis (Fr.) Schroet. On P. deltoides, Kans.; P. tremuloides, N.Y.

M. orbicularis (Pk.) House. On P. grandidentata, N.Y.

M. populicola Thompson (Septoria populicola Pk.), leaf spot. Idaho, Mich., Nebr., N.Y., Vt.

M. populifolia (Cke.) House. On P. deltoides, S.Car.; P. tacamahaca, N.Y.

M. populnea (Sacc.) House (= M. populicola?)

M. populorum Thompson (Septoria musiva Pk.), leaf spot, on some spp. also twig canker. On various poplars in E. U.S. to Great Plains, also in the West.

Napicladium tremulae (Frank) Sacc., shoot blight. Conidial stage of Didymosphaeria populina.

Nectria spp. (N. cinnabarina Tode ex Fr., N. verrucosa (Schw.) Sacc.), on twigs & branches. Occasional. N. galligena Bres., trunk. Great Lakes and N.E. States.

POPULUS -- Continued.

Pholiota adiposa Fr. and P. destruens (Fr.) Bres., wound rot, heart rot. N.W. States & Alaska.

Phyllosticta spp., on leaves, sometimes associated with Septoria or Marssonina. Spp. reported include: P. alcides Sacc., P. brunnea Dearn. & Barth., P. intermixta Seaver, P. maculans Ell. & Ev.

Pleurotus ostreatus Jacq. ex Fr. and P. serotinus Schrad. ex Fr., sapwood rot or sometimes heart rot of living trees. Widespread.

Polyporus spp., wood rot of logs, stumps, and sometimes living trees, typically causing a white spongy rot. Spp. reported most commonly include: P. adustus Willd. ex Fr., P. arcularius Batsch ex Fr., P. caesius Schrad. ex Fr., P. cinnabarinus Jacq. ex Fr., P. crispus Pers. ex Fr., P. dichrous Fr., P. dryophilus Berk. (P. rheades (Pers.) Fr.), P. elegans Bull ex Fr., P. farlowii Long, P. fumosus Fr., P. galactinus Berk., P. hirsutus Wulf. ex Fr., P. picipes Fr., P. pargamenus Fr., P. resinosus Schrad. ex Fr., P. squamosus Huds. ex Fr., P. subchartaceus (Murr.) Overh., P. varius Pers. ex Fr., P. versicolor L. ex Fr., P. zonatus Fr. Widespread, especially on aspen in the West and Northwest.

Poria spp., rot of dead trunks & branches; none reported as causing economic timber rots. Cosmopolitan.

Schizophyllum commune Fr., wood rot, sometimes wound rot. Cosmopolitan.

Sclerotinia bifrons Seaver & Shope and S. whetzellii Seaver, black leaf spot, ink spot. Western and N. E. States respectively.

Septoria musiva Pk., leaf spot. Conidial stage of Mycosphaerella populorum.

S. populi Desm., leaf spot. Reported from various localities but not fully authenticated; conidial stage of Mycosphaerella populi (Auer.) Schroet.

S. populicola Pk., leaf spot. Conidial stage of Mycosphaerella populicola.

Stereum spp. (S. purpureum Pers. and S. rufum Fr., and others), rot of dead trunks & branches. Cosmopolitan.

Taphrina aurea Pers. ex Fr., yellow leaf blister. N.E. to Great Lakes States, Pacific Coast.

T. johansonii Sadeb., catkin deformity. Widespread.

Trametes spp. (T. hispida Bagl., T. suaveolens Fr. & T. trogia Berk.), wound rot, white heart rot of standing or fallen trunks. Widespread, especially in the West and Northwest.

Trochila populorum Amer. auth.): Drepanopeziza populi-albae.

Uncinula salicis DC. ex Wint., powdery mildew. Widespread.

Valsa ambiens Pers. ex Fr., and occasionally V. leucostoma Pers. ex Fr., on dead branches. Widespread.

V. nivea Hoffm. ex Fr., on twigs & branches, sometimes causing canker.

V. sordida Nit., canker on some spp., usually following injury. Widespread.

(Venturia tremulae Aderh.): Didymosphaeria populina.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

# AN ABNORMALITY OF ABIES BALSAMEA

Edith K. Cash

An abnormal condition of twigs of Abies balsamea shipped from Newfoundland for use as Christmas greens was observed in December 1939 and specimens intercepted by the Plant Quarantine inspectors of the Bureau of Entomology and Plant Quarantine in New York City. Additional material has subsequently been observed at Buffalo on Abies from Nova Scotia and obtained in abundance by inspectors at the port of Boston on shipments of balsam fir from New Hampshire. Abies lasiocarpa showing a similar condition has also been collected in Colorado by Ross W. Davidson of the Division of Forest Pathology of the Bureau of Plant Industry. The cause of the abnormality and the extent of its distribution have therefore become a matter of interest.

A conspicuous number of staminate blossom buds is present along the apical stems in these specimens. The development of the terminal bud is often checked, causing an abnormally dense branching of the twig. The scales around the staminate cones formed in previous years remain attached to the twigs after the cones have fallen out, and twigs bearing such scales are slightly swollen. Affected portions of the twigs bear some resemblance to certain insect galls, but neither insects nor mites have been found in the specimens examined by entomologists. In most of the material no trace of any fungus has been detected, but in the specimens first intercepted from Newfoundland the presence of sclerotia on the affected twigs suggested that the abnormality might be due to a fungus. These sclerotia are black, depressed-globose, and surrounded by cup-like sheaths formed by the basal scales that remain attached to the twig after the staminate cones have fallen. No sclerotia were found in other specimens examined.

A similar phenomenon affecting Abies alba in Austria was described by Wettstein in 1887. These firs also showed dense branching of the twigs and an abnormal increase in the number of staminate blossom buds, a bud sometimes developing in every leaf-axil. As in the Newfoundland specimens, sclerotia were observed in sheaths formed by the scales at the base of fallen cones, and the affected twigs were swollen. Apothecia developed both in culture and in nature from the sclerotia on Abies alba and the causal fungus was described under the name of Sclerotinia kerneri Wettstein.

In the absence of any apothecial stage of the Newfoundland fungus, its identity cannot be established. However, the close resemblance in appearance and manner of development of the sclerotia to authentic specimens of the European Sclerotinia kerneri suggests that the abnormal condition of Abies in North America may be due to a closely related fungus, if not to the same species. It is hoped that more information may be obtained from additional collections of the sclerotial stage.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

# A SYSTEMIC ARSENIC TOXICITY OF PEACH AND APRICOT ON OLD APPLE LAND

Earle C. Blodgett

Investigations of stone fruit troubles in Idaho since 1936 have brought to attention and more detailed study, several obscure diseases. A systemic arsenic toxicity of peach and apricot resulting in leaf spotting, shot holing and defoliation has been very interesting because of its seriousness and similarity to several other troubles caused by different factors.

The first records of the disease were made on young apricot trees at Lewiston and Emmett, Idaho in the summer of 1936 (1). Several additional cases, particularly peach, have been noted and young Italian prune trees have exhibited similar symptoms. Detailed notes have been taken on peach trees in two orchards, and these individual tree mappings continued for 4 years showed some trees with as high as 95 percent defoliation and marked reduction in vitality by the middle of September. Observations on these early cases, however, showed symptoms which were somewhat easily and frequently confused with those of different diseases. It is now well known that in certain instances, cases of the systemic arsenic toxicity were mistaken by some growers and certain workers alike for Coryneum blight (shot hole) infection of the leaf and for the (western) X-disease. Arsenical spray injury to peach foliage also entered into some of these complexes.

Budding tests showed that one type of leaf spotting was caused by a transmissible factor and was therefore regarded as caused by a virus. This disease has been diagnosed as the (western) X-disease (8). About the same time, tests showed that neither Bordeaux mixture nor lime sulphur sprays gave any control of the foliage spottings except those caused by Coryneum beijerinckii Oud. [C. carpophilum (Lév.) Jauch] which was readily isolated from typical infections. In addition, two of the apricot trees from Emmett were transplanted to the plots at Moscow and have since (1937) shown no indication of leaf spotting (2). Therefore, by 1939 after three seasons work with the peach leaf spot, defoliation complex, the writer decided that a fairly common serious disease was caused by certain adverse soil conditions. Observations showed that this non-infectious type of leaf spot and defoliation occurred so consistently on peach trees growing on old apple land that it suggested spray residues in the soil might be the cause (3, 4, 6). Soil from around one badly affected tree was used to grow four young potted peach trees in the greenhouse, and typical symptoms were produced while soil with no previous orchard history permitted normal growth of the trees. Further data from orchard surveys in 1940 (5) and in 1941 and the generally high arsenic content of soils in orchards where the condition was prevalent substantiated the results and the early observations.

More conclusive evidence that arsenical spray residues in the soil cause the injury to young peach and apricot trees (and to a less extent prunes) resulting in severe leaf spotting and defoliation was secured in a test started in 1941. Known amounts of arsenate of lead were applied to virgin soil in 12 quart pails in which young peach trees were grown. Typical symptoms appeared on the treated trees in August and became more pronounced

as the season advanced. Severity of symptoms corresponded in general to the amount of arsenic added, but some of the higher concentrations did not permit growth. This experiment is being continued and further information is anticipated on some phases.

On the basis of orchard mappings, surveys and tests covering 5 years work, systemic arsenic toxicity expressed as leaf spot and defoliation of peach is believed to be caused by arsenical residues in the soil and is characterized as follows: There is no sign of damage until mid-summer or later when the foliage shows blotches or spots between the veins. The tissue becomes brown, dies and dries up usually falling out leaving a shot-holed appearance and in extreme cases a lace leaf effect. The necrosis of tissue is usually marginal at first, finally working into the areas between the veins. The older leaves are affected first and only tufts of young leaves may be left at the tops of branches. Affected leaves either fall off while still mostly green or they may yellow and fall in August or early September. Sometimes trees may be entirely defoliated 2 months before normal leaf fall and the twig tissue dries back although observations show that peach and apricot trees on old apple land generally make satisfactory terminal growth. In some cases defoliation is early enough to prevent proper ripening of the crop and the small, bitter fruit is worthless.

Only rather young trees are known to be seriously affected, partly because only within recent years have old apple orchards been removed in these localities and peach trees planted in their places. There is good evidence, too, that the same trees when older (four seasons mapping tree by tree) show less injury and thus a tendency to recover. It is believed that as the trees enlarge and the roots penetrate deeper and into wider areas there is less concentration of arsenicals. Possibly some of the material becomes less toxic over a period of time. Trees set in or near the old apple tree holes show more injury than those between the original apple tree locations. Soil type and management practices exert great influences on the type and amount of injury and seasonal conditions account for great variations in the disease.

It is well known that the peach, in particular, is very sensitive to arsenical sprays, and the writer has thought for some time that there is a close similarity between the types of injury produced by spraying and by arsenical residues in the soil. Peach trees inter-planted with apple trees have in several Idaho orchards been entirely defoliated by arsenical sprays applied to apples for codling moth control. Reeves and Hutchins (7) believed that certain foliage symptoms of peaches (group 4) were found on trees inter-planted with apples; also, that toxic substances in the soil brought about by accumulation of spray residue from apple trees resulted in leaf spot symptoms (group 5). A marginal spotting of peach foliage in isolated cases in certain Idaho orchards, although very similar to the arsenical injury, has not been traced to this cause (5) (peach, b). It might be suggested that such cases may represent possible virus infection as noted by Zeller and Evans (9) who also called attention to a similar trouble (group 3) described by Reeves and Hutchins (7).

The tests herein reported show that arsenical residues in the soil undoubtedly account for some of the leaf spotting and defoliation of peach trees growing on old apple land. A detailed report of the tests mentioned

here will be given upon their completion, but a preliminary note seems advisable to help clarify some phases of the "obscure" leaf spotting of peach foliage. So far as the writer is aware, no proof has previously been presented to show that arsenical residues in the soil are responsible for a definite peach disease, for which the name systemic arsenic toxicity is given.

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(IDAHO AGRICULTURAL EXPERIMENT STATION).

## NUT DISEASES IN THE PACIFIC NORTHWEST IN 1941

Paul W. Miller

### Persian Walnut Diseases

Walnut bacteriosis (caused by Phytomonas juglandis (Pierce) Bergey et al.). This disease was widespread and unusually severe in the Pacific Northwest in 1941. It is estimated that, on the average, approximately 35 percent of the potential walnut crop in unsprayed orchards in Oregon was either completely destroyed or the quality adversely affected by bacteriosis. In certain regions in the State, losses from this disease were exceptionally severe ranging from 40 to 60 percent.

Mushroom root rot (caused by Armillaria mellea (Vahl.) Quel.). Trees infected by this disease were found in widely separated walnut orchards

in Oregon. However, only a relatively small percentage, estimated at not more than 5 percent, of the trees dying in 1941 succumbed to this malady.

Ring spot (caused by Ascochyta juglandis Bolt.) This leaf spot occurred on the foliage in a number of Persian walnut orchards in Oregon. However, this disease was not economically important as it caused but little defoliation.

Leaf scorch (non-parasitic). Leaf scorch was widely distributed in Oregon in 1941, occurring in greater or lesser amounts in practically all walnut-growing districts in the State. Generally speaking, however, it was not quite so prevalent nor so severe as in 1939 and 1940. Where it was severe, though, this disorder was of considerable economic importance as it typically caused a premature shedding of the leaves. In general, orchards planted on the shallower soils with corresponding limitations in the moisture supply were more severely affected than plantings located on the deeper soils which have greater reserves of soil moisture.

"Black-line" (girdle) of grafted walnuts (non-parasitic). This disorder was responsible for the death of numerous Franquette walnuts, 12 to 25 years of age, grafted on California black walnut rootstocks (Juglans hindsii (Sarg.)) or hybrids of other species with this one. It was not observed in the same variety grafted on Persian seedling rootstocks.

Sunscald (non-parasitic). The unprecedented hot period which occurred in Western Oregon during July 1941 caused appreciable damage to the crop in many cases. In some badly affected orchards it is estimated that about 15 percent of the crop was destroyed by the high temperatures, though the average loss did not exceed 5 percent. In general, the shallower the soil the more severe was the damage.

## Filbert Diseases

Bacterial blight (caused by Phytomonas corylina Miller et al.). Bacterial blight, while widespread, was not generally as severe in the Pacific Northwest as in 1939 or 1940. Tree losses from this disease in young orchards, 2 to 4 years of age, ranged from less than 1 up to 25 percent, the estimated average loss being about 3 percent. While no trees 5 years of age or older were known to have been killed by this disease, it did result in the death of many potential pistillate-flower bearing buds, nut-bearing twigs and branches which indirectly reduced the crop. In certain severely infected orchards in the Willamette valley it is estimated that bacterial blight caused an indirect loss of from 25 to 35 percent of the crop, though the average loss therefrom probably did not exceed 5 percent.

Mildew (caused by Phyllactinia corylea (Pers.) Karst.). This disease was widely distributed in the Pacific Northwest during the late summer and fall of 1941. However, it apparently was of but little, if any, economic importance as the diseased leaves retained their normal green color throughout the infection period and persisted on the trees up to the time of normal leaf fall.

Leaf scald (non-parasitic). Leaf scald was widely distributed and exceptionally severe in the Pacific Northwest in 1941. The increase in the incidence and severity of damage from this leaf disorder is believed to be intimately associated with the unprecedented hot period which occurred in

the Pacific Northwest during July 1941. Leaf scald was of appreciable economic importance as it caused a significant decrease in the functional leaf area and, in many cases, a premature shedding of the leaves. The Brixnut and DuChilly varieties were, on the whole, more severely affected than the Barcelona and Daviana varieties. In general, orchards located on the shallower soils with corresponding limitations in the moisture supply were more severely affected than plantings situated on the deeper soils which have greater reserves of moisture.

Brown-stain (non-parasitic). This disorder, characterized by the extrusion of a brownish liquid from the shell and an abortion of the embryo, was prevalent in greater than normal amounts in the Pacific Northwest in 1941. Crop losses from this disorder ranged from less than 1 up to 15 percent, the estimated average loss being about 5 percent.

Sunburn (non-parasitic). Sunburn, due to the unprecedented hot period which occurred during the middle of July, caused the death of many young filbert trees, 1 to 2 years of age. The damage was particularly severe in young orchards where there were no protectors around the tree trunks. "Heat" cankers were also noted on the upper or exposed surface of branches in older, bearing orchards. This was especially true in orchards where, for one cause or another, the foliage was quite sparse.

(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES).

## SOME OBSERVATIONS ON CEREAL DISEASES IN VIRGINIA IN 1941

S. B. Fenne

Foot rots caused severe losses in many barley and wheat fields throughout Southwest Virginia and in the Shenandoah Valley in 1941. These losses became apparent during December 1940 and January 1941. Many farms were visited and numerous fields were observed in which severe injury had occurred. In one wheat field about 20 percent of the plants in a one-acre plot had been killed; and in a barley field, of approximately 20 acres, about 15 percent of the plants were dead. The damage appeared to be most severe in fields where unfavorable growing conditions had prevailed. The research staff of the experiment station isolated *Pythium* sp. from a majority of the specimens brought in.

Only traces of stinking smut, *Tilletia levis*, scab, *Gibberella zeae*, stripe, *Helminthosporium* sp., and powdery mildew, *Erysiphe graminis*, were observed during the 1941 season. This can undoubtedly be attributed to the exceedingly dry season. Loose smut of wheat, *Ustilago tritici*, and loose smut of barley, *Ustilago nuda*, were considerably more severe than for several seasons. This can probably be attributed to the favorable weather conditions for infection during the flowering season of 1940, thus resulting in a higher percentage of smut in the 1941 crop. Nematodes, *Anguina tritici*, were found throughout the entire wheat growing area of the State. As a result of extension work, millers and growers are becoming more conscious of this disease and control measures are being adopted.

Following the very dry weather during the early part of the 1941 growing season, a period of about 2 weeks of heavy rainfall occurred at the time most small grains were mature and being harvested. This wet weather was favorable for a heavy development of sooty mold, Cladosporium sp. Many growers sent specimens of wheat to this office, reporting what they took to be a new kind of smut. Since the sooty mold fungus was observed to be most severe on those heads containing small shrivelled grain, many growers were convinced that it was the cause of the heavy reduction in yield. It was difficult, therefore, to convince these growers that the exceedingly dry weather during the growing season prevented the normal development of the heads which produced the small shrivelled grain, and that these early maturing plants were then attacked by the sooty mold fungus because of their premature death. Due to the excessive rainfall, sooty mold continued to develop in the shock, and thus rendered much of the grain objectionable for milling purposes.
(VIRGINIA AGRICULTURAL AND MECHANICAL COLLEGE).

## CEREAL RUSTS IN THE GREAT PLAINS REGION

TEXAS: Volunteer grain plants are very large and some volunteer oat plants are heading. Crown rust [Puccinia coronata] on volunteer oats and leaf rust [P. rubigo-vera tritici] on wheat have been observed, but no stem rust [P. graminis] has been found. Slides exposed on October 10 and 16 caught a few rust spores on both dates. (I. M. Atkins, Division of Cereal Crops and Diseases. November 1)

OKLAHOMA: Light to moderate leaf-rust infection has been evident in wheat since October 5 and is severe enough on moderately rank and rank wheat to cause yellowing of all but two or three late-emerged leaves. (V. C. Hubbard, Division of Cereal Crops and Diseases. November 4).

KANSAS: (October 20) Temperatures have been unusually mild in this area and no killing frost has occurred as yet. As a consequence of heavy rains and mild temperatures, many plants that had gone into semi-dormancy during August and September have resumed growth and some are blooming. The same conditions have favored the growth of a great deal of volunteer wheat in eastern Kansas and both leaf and stem rusts are abundant. There also is considerable infection from crown and stem rusts on volunteer oats. Other rusts also are abundant, rust on sorghums, hollyhock, and cocklebur being some of the more unusual ones.

(November 10) The long period of frequent rains accompanied by mild temperatures favored an unusually heavy development of rusts on volunteer or early-sown cereals. The surprising feature of the situation is the heavy infection of leaf rust on wheat in the western third of the State where rust seldom is seen in the fall. Many farmers are complaining that the leaves of volunteer and early-sown wheat are being dried up by leaf rust, thus reducing the amount and value of winter pasture. A company at Lawrence engaged in the manufacture of powdered cereal leaves as a source of certain

vitamins also has reported losses from rust. They had been growing considerable acreages of oats and clipping the leaves at intervals. Their operations were suddenly halted by extremely heavy infections of crown rust that appeared about the middle of October. (C. O. Johnston, Division of Cereal Crops and Diseases).

## BRIEF NOTES ON PLANT DISEASES

CERCOSPORA LEAF SPOT ON CHRYSANTHEMUMS IN ALABAMA: Cercospora chrysanthemi, Heald and Wolf, has been very damaging. The varieties Valencia and Jane have suffered most. The foliage on each of these was very seriously affected in the greenhouse at the Tuskegee Institute. A number of other varieties seemed more resistant. (Geo. W. Carver, Tuskegee Institute, Alabama. November 24).